Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

SHOUT
SHARE
IT

REPORT OF CHIEF OF BUREAU OF BIOLOGICAL SURVEY.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF BIOLOGICAL SURVEY,
Washington, D. C., August 20, 1917.

SIR: I have the honor to submit herewith a report on the work of the Bureau of Biological Survey for the fiscal year ended June 30, 1917.

Respectfully,

E. W. NELSON,
Chief, Biological Survey.

Hon. D. F. HOUSTON,
Secretary of Agriculture.

WORK OF THE BUREAU OF BIOLOGICAL SURVEY.

The work of the Bureau of Biological Survey is conducted along five principal lines: (1) Investigations of the food habits of North American birds and mammals in relation to agriculture, in charge of Dr. A. K. Fisher; (2) biological investigations with special reference to the geographic distribution of native animals and plants, in charge of E. W. Nelson; (3) supervision of national mammal and bird reservations, in charge of G. W. Field; (4) enforcement of the Lacey Act regulating the importation of birds and interstate shipment of game, in charge of W. F. Bancroft; (5) administration of the Federal migratory-bird law, in charge of George A. Lawyer.

ECONOMIC INVESTIGATIONS.

PREDATORY ANIMALS AND RABIES.

The larger part of the work of this section of the Bureau has a direct practical bearing on the increased production and conservation of the Nation's food supply. It is effective in decreasing the great losses of live stock which occur through the ravages of predatory animals and in the reduction of still greater losses of grain and other crops due to noxious rodents. About $287,000 was available during the year for the destruction of wolves, coyotes, bobcats, mountain lions, and other stock-killing predatory animals on the public domain, and for the suppression of rabies widely prevalent in several of the western and northwestern States. This work, already in progress, was expanded and perfected under the original organization, by districts, as follows: (1) Arizona and New Mexico; (2) California and Nevada; (3) Oregon and Washington; (4) Colorado; (5) Idaho; (6) Montana; (7) Utah; (8) Wyoming; (9) Texas.

Each district is in charge of an inspector aided in some cases by an assistant inspector.

The force of hunters and trappers employed has varied according to the season, from 175 to 300 men, who receive salaries for their services and are not permitted to accept bounties from any source. All the skins of animals taken became the property of the Government and were sent to Washington for disposal. Many of these were added to the zoological collection of the United States National Museum and the remainder were sold as other Government property, the net proceeds, amounting to approximately $36,000, being turned into the Treasury.

Trapping, poisoning, and shooting, supplemented by den-hunting during the breeding season, have proved to be the most effective means of reducing the numbers of these animals. Marked improvements in the preparation and distribution of poisoned baits, as well as in scent-baiting traps, have been made during the year. All improvements in methods are at once made known to the entire force of official trappers and widely demonstrated among interested stockmen.

During the year 30,512 predatory animals were taken, including 556 wolves, 22,342 coyotes, 107 mountain lions, 3,053 bobcats, and 60 bears. Bears are generally considered game animals and are not molested by the predatory-animal hunters except in cases of individuals known to have the habit of killing stock. In addition to the capture of animals by means of traps and shooting, extensive poisoning campaigns were conducted, and it is conservatively estimated that at least 75,000 predatory animals were destroyed in this manner.

As a result of this destruction of stock-killing animals a large saving of cattle, sheep, goats, horses, swine, and poultry has been effected, in addition to reducing greatly the danger to human life from rabies. Stockmen have shown much interest in the work and in numerous instances have contributed funds for cooperation. The States of Nevada, Utah, and Washington are also cooperating, having appropriated substantial sums for the purpose.

Few people except those directly affected realize the extent of the losses of stock by predatory wild animals and the necessity for their control. In Colorado a single wolf took a toll of nearly $3,000 worth of cattle in one year; in Texas 2 wolves killed 72 sheep valued at $9 each during a period of two weeks; 1 wolf in New Mexico killed 25 head of cattle in two months; in Oregon 4 coyotes in two nights killed 15 pure-bred rams valued at $20 each; one bobcat in Texas killed over $300 worth of Angora goats, and another, taken at Ozona, N. Mex., in a month had killed 53 lambs, 1 ewe, and 1 goat belonging to a single ranchman.

The damage done by predatory animals has been vastly increased by the prevalence among them of rabies. This disease spread from the point of origin in Oregon into the States of Nevada, California, Idaho, and Utah. Cattle and sheep were destroyed in large numbers and hundreds of persons were bitten. As a result of the campaign conducted by this bureau in cooperation with local authorities and stockmen, the spread of the disease has been checked and conditions have been greatly improved. It is believed that with a continuance of the work complete eradication of this alarming disease among the wild animals of the affected States can be accomplished.

GROUND SQUIRRELS.

The work of exterminating ground squirrels on Government lands within the Fort Totten Indian Reservation, North Dakota, and the Sequoia and California National Forests of California, has been continued, and 208,553 acres have been practically cleared of these destructive pests. The result has been increased productiveness of the lands treated, and also the protection of the crops on adjacent areas. The total cost of this work, including labor, has been approximately 5 cents per acre in North Dakota, and 6 to 7 cents in California.

The methods employed by the bureau have been demonstrated among farmers, who have cooperated in poisoning ground squirrels on holdings adjacent to the public lands treated. In North Dakota organized campaigns against ground squirrels in cooperation with the State Extension Service have continued with increased vigor and thoroughness. The squirrels on about 4,500,000 acres were poisoned during the year by 16,000 cooperating farmers. This resulted in the practical extermination of the pest on the areas treated and a saving in this year's crops valued at more than $1,000,000. Similar savings may readily be effected elsewhere in the vast areas infested by these animals.

Campaigns along the same lines, under project agreements, have been started in Montana, Idaho, and Oregon in cooperation with State extension services and are being planned for other States. Demonstrations of methods have been made on a large scale in Nevada and California, where increasing interest is being developed in organizing systematic campaigns for the extermination of ground squirrels.

RABBITS.

Serious depredations by jack rabbits upon wheat, barley, oats, alfalfa, and other growing crops and stacked hay necessitated continued efforts for their control in eastern Oregon, California, Idaho, Nevada, Utah, Colorado, New Mexico, and Texas. Effective methods of poisoning the animals were demonstrated and successful campaigns in farming communities organized against them. This work was very successful and enormous numbers of animals were killed. In a single county in Oregon about 75,000 were poisoned at a cost of less than one-tenth of a cent each.

Cottontail rabbits have damaged orchards, grain, and truck farms, especially in Virginia, West Virginia, Maryland, Delaware, and New Jersey, and advice and demonstrations have been given for protection against them.

The European hare, introduced into New York some years ago, has increased and is spreading rapidly in southern New York and adjacent States, where it has done extensive damage to orchards. Investigations have been started to discover methods for the control of this animal, which threatens to become a dangerous pest.

PRAIRIE-DOGS.

Campaigns against prairie-dogs upon national forests and other public lands have been prosecuted vigorously in Arizona, New Mexico, Wyoming, Colorado, and Montana. The first poisoning of

the animals has been completed on about 1,000,000 acres at an average cost of from 5 to 10 cents an acre, resulting in the destruction of about 90 per cent of the animals. In addition 289,000 acres on which the first poisoning had already been done were given a second treatment, resulting in the practical extermination of the pests. As many as 300 dead prairie-dogs have been counted in an alfalfa field within 24 hours as a result of distributing grain poisoned with only one ounce of strychnin. The importance of this work is made evident by an estimate of the Forest Service that the range for live stock improves 50 per cent after the prairie-dogs have been destroyed.

The success of this work on public lands has induced extensive cooperation by private owners. Farmers and stockmen have been aided by demonstrations and have been assisted in organizing, directing, and supervising comprehensive campaigns. As a result a large saving has been effected in growing crops and good yields have been secured on large areas where in many cases the prairie-dog infestation had previously rendered the production of crops an almost hopeless undertaking. Arrangements have been made to increase this work through cooperation with the extension services of several States.

POCKET GOPHERS.

The elimination of pocket gophers from the Ochoco National Forest of Oregon was continued during the fall, and 95 per cent of the animals were destroyed from about 13,000 acres which had been heavily infested. Extensive demonstrations of methods of poisoning were held among the farmers in California, Washington, Oregon, and Idaho, resulting in the elimination of these destructive pests over considerable areas of orchard and other farm lands.

NATIVE MICE AND RATS.

Pine mice, meadow mice, and deer mice have wrought serious havoc in orchards, gardens, and truck and potato farms, as well as in melon-producing districts throughout extensive areas, especially in the Eastern States. Investigations have been conducted and demonstrations of effective methods for the eradication of these pests have been given in Virginia, West Virginia, Pennsylvania, Maryland, Ohio, Indiana, and Iowa, and advice for protection against them has been given on request in many other States. In one county in Virginia the horticultural commissioner estimated a loss of $100,000 to orchardists from apple trees killed by pine mice during the year.

Investigation of damage to forest nursery stock by wood rats has been conducted on the planting areas of the Converse Experiment Station of the Forest Service in California. Many facts of importance relating to their habits and depredations have been determined and advances made in the methods for their control.

HOUSE RATS AND MICE.

The initial steps have been taken to launch a nation-wide campaign for the more adequate control of house rats and mice, notorious destroyers of field crops, stored products, and poultry. Many data relative to damage by them have been assembled, and present conditions in many localities were ascertained by direct inspection. Efforts

have been made to acquaint people with the seriousness of the losses and with simple and effective means of preventing them.

MOLES.

Through investigation of the Townsend mole, a serious farm pest in western Washington, Oregon, and northern California, effective methods for trapping it have been devised, and the fact that its fur possesses a good market value has been demonstrated. Through the efforts of this bureau a market has been found for the fur, and demonstrations throughout the infested area have resulted in extended campaigns for the destruction of these animals and the utilization of their skins. The value of the fur probably will pay for the cost of eliminating the pest.

MOUNTAIN-BEAVERS.

The mountain-beaver, or sewellel, an animal hitherto confined to the forests of Washington and Oregon, and of little economic importance, has recently spread into cultivated fields and caused extensive damage to small fruits and market produce. In response to requests for assistance investigations have been conducted and results obtained which indicate that this rodent may be successfully controlled.

FUR-BEARING ANIMALS.

Studies of the adaptability of native fur bearers to domestication have been continued at the Experimental Fur Farm, in Essex County, New York. The animals now confined there comprise blue foxes, minks, martens, fishers, and skunks. Experiments are being made concerning the feeding, housing, and general management of these animals. Inclosures for the blue foxes, martens, minks, and skunks have been constructed and a fisher yard is now building. Other equipment completed during the year includes an ice-pond, ice-house, and refrigerator, a meat drier, and a workshop.

In addition to the information gathered at the Experimental Fur Farm, an effort has been made to keep in close touch with all phases of the fur industry, from the care of animals to methods of dressing, dyeing, cleaning, and storing furs, in order to make this information available to many inquirers.

The edition of the department bulletin on "Silver Fox Farming" published last year was quickly exhausted and a new Farmers' Bulletin based upon it has been issued. Two other papers—a yearbook article entitled "Fur Farming as a Side Line" and a Farmers' Bulletin containing a summary of laws governing the capture, protection, and propagation of fur animals in the United States and Canada—were published during the year.

FOOD FOR WILD DUCKS.

The extended investigations by the bureau of the food habits of wild ducks are beginning to bear fruit in the form of reports for publication. During the fiscal year there were completed accounts of the feeding habits of three groups—the mallard, the teal, and the gadwall and baldpate. The studies necessary to the production of

these reports have been the basis also of publications on the propagation of wild-duck foods, four of which have been issued, one during the present year. This latest bulletin treats in detail eight groups of wild-duck food plants and recommends 40 others in the hope that dealers may be induced to put them upon the market. Sportsmen are showing a lively interest in this part of our work, owing to its direct practical bearing on the perpetuation of our migratory waterfowl.

STARLING STUDIES.

Field investigation of the economic status of the introduced starling, begun in April, 1916, was continued until the middle of October in New Jersey, Pennsylvania, New York, Connecticut, Rhode Island, and Massachusetts. Subsequently, most of the stomachs collected were examined in the laboratory and the resulting information placed in tabular form.

The starling has been found destructive to cherries and, to a much less degree, to late fruits, but the bird has been proved also to have many redeeming qualities. While the exact extent of its insect-eating habits can not be established until all the material is examined, enough has been learned to warrant the statement that it is one of the most effective bird enemies of ground-insect pests, in this respect ranking much higher than some of our common native birds.

Reports that starlings are driving out native species are frequently exaggerated, and, when considered from a purely economic standpoint, should cause no alarm, as the starling must be considered at least equal, if not superior, to two of the species most frequently molested, namely, the flicker and the robin. The latter, especially, is proving to be a distinct menace to the raiser of small fruits in some sections of the Northeast. Experiments were conducted to perfect methods for eradicating starling roosts where these are established in residential sections of cities.

ECONOMIC STATUS OF OTHER BIRDS.

Examination of bird stomachs by groups was continued to the extent permitted by other assignments of the staff. The principal work along this line was analysis of pellets of owls, and of the stomach contents of hawks and owls. Studies of the wood duck were completed, and a large number of stomachs of cowbirds, red-winged and crow blackbirds, and robins collected during the starling investigation were examined, to supply data for comparison between the economic tendencies of these birds and the starling. A Farmers' Bulletin entitled "Common Birds of Southeastern United States in Relation to Agriculture" was published during the year. It shows the food habits of 23 species of that region and gives a general account of the relations of birds to the insect pests of the South. A report on "The Crow and Its Relation to Man" and on "Food Habits of the Swallows: A Family of Valuable Native Birds" have been submitted for publication.

INFORMATION ON ATTRACTING BIRDS.

By means of a series of publications information has been disseminated on methods of attracting birds and increasing their numbers. Most of the species which are susceptible of approach along

these lines are chiefly beneficial to man, and increasing their numbers is equivalent to decreasing losses by injurious insects. The problem of attracting such birds has been treated by sections of the United States, and publications on the Northeastern and Northwestern States have been issued. One relating to the Middle Atlantic States is in press and one for the East Central States has been prepared for publication. A further manuscript in this series, entitled "Attracting Birds to Public and Semipublic Reservations" also has been completed.

THE CARE OF CAGE BIRDS.

In response to a large and growing correspondence relating to canary birds, a Farmers' Bulletin entitled "Canaries: Their Care and Management" has been issued. In it the history of the domestication of this bird is touched upon, and a brief account is given, with illustrations, of the common and fancy varieties, which are distinguished by shape and color. The chief usefulness of the bulletin is in its discussion of practical problems on the care and breeding of these popular cage birds.

DISEASES OF WILD DUCKS IN UTAH.

The investigations of the conditions that cause the death of enormous numbers of wild ducks and other waterfowl around Great Salt Lake, Utah, were completed at the close of the field season of 1916. An assistant engaged in this work was stationed in the marshes in the Bear River delta, at the northern end of Great Salt Lake, from May until October. Experimental work and field observations were carried on there at a temporary field laboratory, and the cause of the main trouble was definitely established as due to chlorides present in the alkaline waters and in the efflorescences on the mud flats. A report, embodying the results of this work has been prepared for publication.

It was learned in 1915 that a considerable number of waterfowl of various species die in different parts of the country every year from lead poisoning caused by eating the scattered shot that accumulate at the bottom of the water about shooting blinds. Further investigations into this trouble were made during 1916, and a report thereon completed.

During the course of these investigations much information was gathered concerning the breeding, summer and fall movements, and habits of wild ducks in the great marsh areas at the mouth of Bear River, Utah. A study was made of the available natural food supply for waterfowl, and in 1916 a count was made of the breeding ducks of that region. A report covering these observations is in course of preparation.

BIOLOGICAL INVESTIGATIONS.

Field investigations of the distribution, abundance, and habits of birds and mammals have been carried on in various parts of the United States, and the work of collating published information on the same subjects has been continued. The information gathered has been of use in the other activities of the bureau, concerned with the administration of the Federal migratory-bird law, the enforcement

of the Lacey Act, the regulation of importations and interstate shipments of birds, the maintenance of bird and mammal reservations, and investigations of the economic relations of birds and mammals.

DISTRIBUTION AND MIGRATION OF BIRDS.

Reports on the migration of birds were received, as in past years, from more than 300 volunteer observers located throughout the United States, in many parts of Canada, and in Alaska. Information regarding the distribution and migration of birds was gathered from many published sources as well. The data secured from these various sources were tabulated on about 100,000 cards, which were added to a file system already containing more than 1,000,000 cards. Progress was made in the preparation of reports on the distribution and migration of several families of waterfowl.

BIRD COUNTS.

The second annual report of bird counts in the United States, with discussion of results, was published. Results of the third count, made in the summer of 1916 by about 200 volunteer observers, have been partly tabulated. The fourth annual count was made by about the same number of observers during the summer of 1917, and many reports have been received. These bird counts throw much light on the conditions most favorable for useful species, and show that the numbers of such species on the farms of the United States may be largely increased by furnishing them protection and food. Results of great interest and value already have been obtained from these counts, and others doubtless will be brought to light as the investigations are continued. After a few years we shall have from these counts the first fairly accurate basis for an estimate as to the increase or decrease of useful birds in certain parts of the country.

BIOLOGICAL SURVEYS.

Progress was made in the biological surveys of Arizona, California, and Montana, and field work on the survey of Oregon was finished. A report on the life zones of Wyoming is now in press, and one on the mammals of that State has been completed. Reports on the birds of New Mexico, mammals of New Mexico, and birds of Texas are ready for publication. Field work on the survey of Alabama was completed and the report on the birds brought up to date. Arrangements have been made with the State of Alabama for cooperation in the publication of this report. A report has been prepared on the mammals of the Canal Zone, forming a part of the results of a biological survey of that region undertaken in cooperation with the Smithsonian Institution in 1911 and 1912. A reconnaissance of the Okefenokee Swamp region of southeastern Georgia was undertaken in the winter, preliminary to a biological survey of the State. Preliminary work also was begun on biological surveys of Washington and Wisconsin.

MIGRATORY WILD FOWL.

During July, 1916, in continuation of work begun in June, an investigation of the principal areas within which migratory waterfowl breed was carried on in various parts of the eastern half of North

Dakota. In the winter field investigations were made on the numbers, distribution, and habits of waterfowl wintering in southeastern Georgia and central and eastern Florida.

TECHNICAL STUDIES.

Technical revisions of the flying squirrels and rice rats were completed and are ready for publication. A revision of the so-called mountain-beavers (genus *Aplodontia*) was finished and arrangements made with the University of California for its publication. Studies of the grizzly and big brown bears were revised and the results are now in press.

As in previous years, a large number of specimens of mammals and birds have been identified for public institutions and individuals, and considerable progress has been made in mapping the distributions of both mammals and birds.

MAMMAL AND BIRD RESERVATIONS.

The section of mammal and bird reservations is charged with the maintenance of 74 national reservations, of which 5, including the Niobrara, originally created as a bird reservation, are big game preserves and 69 are bird reservations; and with the supervision of transfers of game. In the big-game reservations at the end of the fiscal year there were 246 head of buffalo, 184 of elk, and 49 of antelope.

GAME PRESERVES.

National Bison Range, Montana.—The bison herd on the range came through the winter in very satisfactory condition. Thirty calves born in the spring increased the number of buffalo on the range to 194. The losses during the year included 3 adult animals, a bull and a cow that died in the fall of 1916 and a cow that was unable to give birth to her calf. The nucleus of this herd, 37 animals, was placed on the range in the fall of 1909, and 3 others the following year. Only 5 bison have died since the herd was established.

The 75 elk and 26 antelope on the range wintered well, but complete returns on the number of young born to these herds have not yet been received.

A mile of the boundary fence running through the Jocko River Swamp, which was subject to overflow, was rebuilt on higher ground, eliminating a serious danger of animals escaping from the reservation.

Wind Cave National Game Preserve, South Dakota.—With 7 calves born this year the total number of buffalo on this preserve is 34. Animals lost during the year include 1 crippled buffalo, which it became necessary to kill, 2 elk, and 3 antelope. There are 61 elk and 23 antelope on this refuge, exclusive of the young born this year. Antelope born on the range are wilder and apparently hardier than those transferred to the refuge, and it is believed that in time a satisfactory herd of these beautiful and rapidly disappearing animals will be built up.

Winter Elk Refuge, Wyoming.—Owing to an unusually severe winter the losses of elk were somewhat larger than usual. During

the spring alarming reports as to the excessive losses of elk in both the northern (Yellowstone) and the southern (Jackson Hole) herds gained circulation, but careful investigation on the ground by employees of the National Park Service, Forest Service, and Biological Survey proved these statements to be unwarranted.

From the investigations and counts conducted by our representatives, together with other reliable information at hand, it is probable that not more than 1,500 elk died because of snow and lack of food in the 240 square miles which constitute the principal winter elk range in the Jackson Hole region. Of this number, approximately 70 per cent were calves, 25 per cent cows, and 5 per cent bulls. Including the snowbound animals illegally killed by tusk hunters and poachers, 2,000 elk are regarded as a close approximation of the total mortality in the region. The great number of deaths along the roads, at feeding places, and at river crossings gave the impressions earlier in the season which were responsible for overestimating the losses.

The total number of elk fed at the Jackson Hole refuge was approximately 6,000. Feeding began on January 15, and the hay was practically exhausted by April 5. Of the 900 elk which died on the feeding grounds this winter, 794 were calves. About 250 calves came from the foothills to the feeding grounds in the latter part of February and nearly all perished. Experience has proved that it is almost impossible to save young elk by feeding hay after they have reached a seriously emaciated condition, and chances for succoring them are greatly lessened where fed with a great band in which older and stronger animals predominate. Experiments will be conducted in fencing off feeding lots where the smaller animals may be fed without interference from the larger and stronger elk, in order to lessen losses in the calf crop.

During the year, 588 rods of fencing have been constructed, protecting about 800 acres of grazing land for the elk. Additional equipment has been purchased, including a team of horses, haying machinery, and other agricultural implements required to insure a larger yield of hay from the reservation through the extension of the irrigation system and the plowing and seeding of certain areas to tame grasses.

In addition to 660 tons of hay harvested on the refuge and fed to the animals, about 400 tons were purchased and fed by the Wyoming State officials.

Niobrara Reservation, Nebraska.—The small herd of buffalo on this reservation is increasing steadily, as evidenced by 4 calves born this year, making a total of 18 animals in the herd. The 34 elk wintered without losses, but no report on the calf crop has been received. Lack of range facilities in the present small inclosure precludes bringing additional animals to the reservation.

Sullys Hill Game Preserve, North Dakota.—With the completion of the six miles of 88-inch woven-wire fence on Sullys Hill, this game preserve was made ready for stocking early in the year. Contracts have been let for the construction of a 5-room frame cottage as headquarters, together with a frame barn, and these improvements were nearly completed at the close of the fiscal year.

Fifteen elk transferred from Yellowstone National Park (Gardiner, Mont.) in March arrived in good condition, with the exception of 1 animal, which died a few days afterward. Four deer, 3 of which were does, secured from the North Dakota Agricultural Experiment Station at Fargo, were transferred to Sullys Hill, but 1 of the does, injured in crating, died shortly after being liberated.

Arrangements are being made for placing a small herd of buffalo on the reservation in the near future.

TRANSFER OF GAME.

Through cooperation with the Department of the Interior and the Forest Service 90 head of elk were transferred from Yellowstone National Park. Fifty of these were taken to national forests in Colorado, 25 to the Pisgah National Forest in North Carolina, and 15 to the Sullys Hill Game Preserve in North Dakota. No elk were transferred from Jackson Hole.

NATIONAL BIRD RESERVATIONS.

Two new national bird reservations, the San Francisco Bay Reservation in California, and the North Platte Reservation in Nebraska, were created and set aside by Executive order in August, 1916, thus increasing to 70 the number of bird reservations administered by this bureau. This includes the Niobrara, now used also as a big game preserve.

Klamath Lake, Oregon.—Owing to plans for lowering the water level and reclaiming certain of the marsh lands within the reservation, conditions in general have not been entirely satisfactory. Bird life has been normal, but because of the late spring in the region, nesting and brooding has been later than usual. The Government-owned launch has been placed in first-class repair and is now available for patrolling the reservation north of the railroad embankment. A new launch, provided by the National Association of Audubon Societies, for patrolling the southern portion of the lake, was completed and placed on the lake June 30, 1917.

Malheur Lake, Oregon.—As at the Klamath Lake Reservation, conditions at Malheur Lake have been unsettled, owing to the agitation of a plan to reclaim the marsh lands within the reservation by deepening the channel between Malheur and Harney Lakes, and shutting off the intake of water from the Blitzen and Silvie Rivers. To date, no actual work has been undertaken on this project. If it should be carried out it would result in the destruction of one of the greatest breeding grounds for waterfowl remaining in the United States, and would deprive the State of a valuable natural asset.

Big Lake Reservation, Arkansas.—Temporary warden service has been maintained on this reservation since October, with very gratifying results. The Arkansas Fish and Game Commission placed a motor boat on the lake at the disposal of the warden patrolling the reservation, and this greatly improves the efficiency of the supervision exercised. The illegal practice of killing ducks and other waterfowl on and in the vicinity of the reservation and removing them by motor boats and automobiles across the Missouri boundary,

for transportation to the markets of the Middle West, has been broken up through cooperation of Federal agencies and State officials.

In a cyclone which crossed the reservation at Cotton Wood Point on May 27, seven persons were killed, two were seriously injured, and considerable damage was done to the cabins and house boats in the vicinity.

Hawaiian Islands Reservation.—Reports from several sources indicate that foreign fishing parties and other poachers have been robbing the nests of birds on numerous islands of this reservation and elsewhere in the Territory. A report from Lieut. Wm. Todd, of a United States naval party which on May 24 visited the reservation, states that some ten or twelve thousand birds nest on Bird Island and that all the nests on the eastern slope and most of those on the top of the island have been robbed of eggs.

Laysan Island has not been visited during the year, but it is feared that the rabbits on this island will become so numerous as to denude it of vegetation. Undoubtedly it will be necessary to dispatch a party in the near future to exterminate these rodents, for through their destruction of the vegetation they seriously menace the existence of several species of land birds on the island.

INTERSTATE COMMERCE IN GAME.

Forty-five violations of sections 242, 243, and 244 of the Penal Code of the United States, known as the Lacey Act, were reported to the solicitor during the year. These cases included the interstate shipment of wild ducks, partridges (ruffed grouse), quail, prairie chickens, venison, squirrels, and the hides of fur-bearing animals illegally killed in or illegally shipped from the States of Colorado, Illinois, Indiana, Kansas, Kentucky, Minnesota, Mississippi, Missouri, New York, Oklahoma, Oregon, South Dakota, Tennessee, Utah, and Wisconsin. Four of the cases were for knowingly receiving game illegally shipped in interstate commerce. One of these has already been disposed of with a fine of $400 and costs, the maximum of $200 on each of two counts. This is one of the heaviest fines ever imposed for an offense of this character.

Thirty-two cases, including a few reported in the previous fiscal year, were disposed of by the courts, as follows: Twenty-nine by convictions and the impositions of fines and costs amounting in all to $1,522, and one by a jail sentence of 30 days. One case was dismissed for lack of sufficient evidence and in one a verdict of not guilty was returned.

Two additional inspectors were appointed on May 1, making five now engaged in investigating violations of the Lacey Act. The country has been divided into five districts, each in charge of an inspector, and the bureau is thus able to investigate more promptly reported violations. Special attention has been given to illegal shipments of quail from a number of the Middle Western States, and 22 cases have been reported. Violations of the Lacey Act are becoming fewer each year as a result of the increased activities of the bureau and the closer cooperation of State game officials and others interested in game conservation. Only two States now permit hunting for the market—Louisiana and South Carolina.

IMPORTATION OF BIRDS AND MAMMALS.

War conditions in Europe have had a marked effect on the importation of birds and mammals during the year. The total suspension of importations from central Europe and the prohibition of the exportation of birds by Great Britain has compelled importers in the United States to rely almost entirely on South America and the Orient for live animals and birds. During the year, 413 permits were issued, as compared with 411 in 1916. Inspections numbered 112, as compared with 163 in 1916, and 97,993 birds and 4,135 mammals were imported under permits. Among these were 16,471 canaries, 35,507 miscellaneous game birds, and 46,015 nongame birds. Besides these, 7,007 birds and 339 mammals requiring no permits were admitted to entry. At Honolulu only 16 permits were issued, for the entry of 515 birds, principally pheasants. So far as known no prohibited species were brought in during the year. Many foxes for fur farming purposes have been imported from Canada, particularly from the Maritime Provinces, but the total number is less than last year.

The number of pheasants imported has reached the lowest point in 15 years, having declined from 15,412 in 1912 to 832 in 1917. European partridges are conspicuous by their absence, practically none having been imported during the year, and apparently few waterfowl are included among the entries. Canaries have decreased from 392,422 imported in 1916 to less than one-fourth of this number, and as a result the prices of these popular and formerly cheap cage birds have risen so high as to be almost prohibitive.

Traffic from the Orient has caused the port of San Francisco to assume almost as much importance as a receiving port for birds and mammals as that of New York, and most of the rare species have come through the west coast. An unusually large shipment of rare mammals and birds from Australia reached Seattle on November 9, and the specimens were ultimately distributed to several zoological parks in the East and West. The most noteworthy mammals imported were several rare kangaroos, including the island, Parry, and tree kangaroos, and black swamp wallabies; among the birds were two keas, or sheep-eating parrots (*Nestor notabilis*), from New Zealand, the first imported since 1906; and the ocellated Mallee fowl (*Alectura ocellata*). Of the species of birds imported for the first time into the United States were a pair each of the Australian white ibis (*Ibis m. strictipennis*) and straw-necked ibis (*Carphibis spinicollis*), and a New Zealand giant petrel (*Macronectes giganteus albus*) from the Australian and New Zealand seas. Among other interesting importations were two bell birds (*Chasmorhynchus nudicollis*) from Brazil; a babbling thrush (*Icoterus komadori*) from the Liu Kiu Islands; and several species of Philippine birds, including the spotted button quail (*Turnix ocellata*) and the Philippine rail (*Hypotænidia torquata*).

IMPORTATION OF QUAIL FROM MEXICO.

Joint regulations governing the importation of quail from Mexico were issued by the Treasury Department and the Department of

Agriculture under date of November 13, 1916. For the first time these regulations prescribed the use of standard crates to prevent crowding the birds while in quarantine and to insure proper ventilation and sanitation. As in the previous year the ports of entry were Eagle Pass, Tex., and New York City, but all entries were made at Eagle Pass. Through cooperation with the Bureau of Animal Industry a careful and thorough inspection of the birds was made during the 10-day period of quarantine. The first permit was issued November 27, 1916, and the issue of permits was suspended on February 15, 1917. The number of quail for which permits were issued during the two months and a half was 42,973, and the number released from quarantine 32,814; as compared with permits issued for 12,989, and the importations of 8,000 in 1916. The total number brought in last season was much larger than in any previous year, and special efforts were made by some of the importers to facilitate in every possible way the handling of the birds prior to quarantine and to insure prompt shipment after release. In two cases, State game commissioners arranged for the shipment of their birds from Eagle Pass in special cars in charge of their own employees. While the losses during quarantine were small and only a few cases of quail disease were detected near the close of the season, heavy losses from other causes were reported after the birds reached their destination. Two States which received nearly half the total number of quail reported losses of about 50 per cent. Attempts to handle quail in carload lots can hardly be considered successful as yet, although the losses en route are very small.

At the rate importations were made last season the available supply of Mexican quail in the region adjoining the Rio Grande will probably last but a few years. Under the circumstances, it is a serious question whether better results will not be secured and more actual progress made in restocking if the birds are handled in smaller lots and given more careful attention after arrival than if they continue to be handled in shipments of several thousand each.

INFORMATION CONCERNING GAME LAWS AND GAME.

The regular annual publications, including a directory of game officials, the seventeenth annual summary of game laws, and a general poster showing open seasons for game, were issued, and the demand for them continues to be large. New game laws passed by the various States have been carded and the index of game legislation has been kept up to date as fast as the new laws are received; under the latter head is included the preparation of a subject index and memoranda on some of the more important phases.

Investigations were begun the last part of the year to determine the value of game as a national asset. No comprehensive information on this subject is now available and the need for it has become increasingly evident. The work is being done with great care, and the data already gathered indicate that the results will prove of much importance not only to hunters but to State officials and to the States, as showing the necessity for better laws and better enforcement in conserving one of our important national resources.

FEDERAL MIGRATORY-BIRD LAW.

As experience has been gained in the administration of the migratory-bird law, act of March 4, 1913 (37 Stat., 828, 847), it has become necessary to readjust some of the prescribed seasons under the regulations first adopted by the department on October 1, 1913. Amended regulations were prepared and promulgated October 1, 1914, and again on August 21, 1916. These amendments eliminated certain provisions which experience proved were not essential for the conservation of migratory birds and prescribed seasons which were generally more satisfactory to State game officials and sportsmen, and at the same time gave the birds adequate protection.

For administrative purposes the United States is divided into 13 districts, now under the supervision of 16 inspectors, who, with the assistance of 186 Federal wardens, enforce the regulations in the various States. During the year the commissions of 33 Federal wardens were terminated and 29 new wardens were appointed.

The district inspectors and Federal wardens reported 208 cases of violation of the regulations, which make a total of 859 cases to date. Since the law became effective prosecutions have been had in 29 cases, resulting in convictions and impositions of penalties in all but 5. Fines were paid in 18 and suspended in 6 cases. Twenty-five cases are now pending in district courts in various parts of the country; and the transmission to the Department of Justice of 805 cases, including those reported this year, is withheld pending the decision of the United States Supreme Court in the case of The United States *v.* Harvey C. Shauver, involving the constitutionality of the law.

That the violations reported by no means approximate the number that have occurred is to be expected and is due to the impossibility in many cases under the law of securing evidence sufficient to convict. Possession of wild fowl during the closed season is not a violation under the Federal act, and there must be evidence of actual shooting or capture on which to base a prosecution. Furthermore, inspectors and wardens appointed under authority of the law have no power of arrest, and hence many violators escape.

Notwithstanding the difficulties attending enforcement, the present law is very generally observed, and communications received from game and fish commissioners and other persons contain incontrovertible evidence that since the law became effective a very marked increase in the number of waterfowl and shorebirds has been noted in most of the States; that wild fowl have become unusually tame in spring; and that many thousands of waterfowl are breeding in certain localities where they had not nested for many years. The consensus of opinion attributes these greatly improved conditions to the abolition of spring shooting and the general observance of the regulations.

Owing to the limited number of inspectors available, it has been necessary to confine their activities to States where they were most needed, leaving many States with little or no supervision. In many instances the State authorities have cooperated and have rendered efficient assistance. State legislatures have made progress in line with the Federal law and regulations, and during the year 18 States amended their laws to the extent of making the open seasons on

waterfowl conform with the open seasons under the Federal regulations; in 6 other States legislation was enacted to unify the laws, and practical uniformity with the regulations was thus secured.

A treaty between the United States and Great Britain for the protection of migratory birds was concluded at Washington August 16, 1916, and was ratified by the Senate August 29 and by Great Britain October 20; ratifications thereof were exchanged December 7 and it was proclaimed by the President December 8, 1916. A bill to give effect to this treaty was introduced in the short session of the Sixty-fourth Congress and was reintroduced at the extra session of the Sixty-fifth Congress, where it is now pending.

That the necessity of Federal protection of migratory birds is now generally recognized and that the results accomplished under the law and regulations have been highly satisfactory are demonstrated by the action of the National Association of Game and Fish Commissioners in endorsing unanimously the bill to give effect to the treaty and in urging its immediate passage by Congress.

These results following so soon after the enactment of the law have proved the efficacy of Federal protection of migratory birds and serve to show what may be accomplished under a law, such as the treaty enabling act, conferring the additional powers necessary to its effective enforcement.

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1917